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THE KOREAN AGRICULTURAL STATISTICS AND DATA SYSTEM: REVIEW AND RECOMMENDATIONS

by a

Task Force

of the

Korean Agricultural Planning Project

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20 August 1974

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SUMMARY OF RECOMMENDATIONS

Relevant, accurate, timely and consistent data is required for analysis, research, and contributing to sound planning, policy formulation, program development, and project design and evaluation. The agricultural data system in Korea consists of several agencies in and outside MAF with responsibility for collection, processing, and dissemination of data related to the agricultural sector. The task force found the Korean agricultural data system to be relatively sophisticated and progressive. Officials are competent, dedicated, and interested in system improvement. The following recommendations, based upon evidence documented in this report are made by the task force in the spirit of helping to make a basically sound system even better. More detailed recommendations and rationale can be found on the pages indicated in parenthesis after each of the broad recommendations below.

1. An Agricultural Data Review and Coordinating Committee should be established consisting of major collectors and users of agricultural data for the purposes of coordinating, monitoring, and establishing broad policy pertaining to the activities of the agricultural data system to insure that it is responsive to the needs of the various data users. (Pages 27-31)
2. Fragmentation in data collection efforts should be reduced. Agencies should retain the prerogative of collecting data for internal administrative and monitoring purposes. But all data collected for use by more than a single agency should become the responsibility of the Statistics Bureau. As

consolidation takes place several additional benefits can be attained if attention is paid to them. Included are:

a) elimination of overlaps and voids in data collection.

b) increased accuracy due to elimination of goal oriented bias.

c) greater timeliness and user orientation of data released.

d) better coordination of data publication.

e) consolidated training activities for enumerators and tabulators.

f) ability to cooperate more fully with users on further data analysis.

(Pages 31-35)

3. The present plan for continued fragmented agricultural outlook activities as the responsibility of several action agencies of MAF should be seriously reconsidered. The responsibility for outlook work should be housed in the Statistics Bureau, MAF, or NAERI, or as a closely coordinated joint activity of both. (Pages 36-38)

4. An agricultural statistics consultant should be assigned under the Korean Agricultural Planning Project for 1 year to work with the Statistics Bureau, MAF and other agencies identified as part of the Korean agricultural data system to recommend and help implement changes in the data system with respect to collection, processing, storage, and retrieval of agricultural data to make the data more relevant, timely, accurate,

and consistant for use in planning, policy, program, and project activities dealing with further development of the agricultural sector and the economy as a whole. (Pages 41-44)

5. A committee should be appointed in MAF to study and make recommendations to the Minister with respect to the method of procuring and administrative, institutional, and technical design of computer services required by MAF over the next several years. As a related activity a representative of the Statistics Bureau should be assigned to the KASS team, NAERI, on a full time basis for about 6 months beginning about October 1974 to work with the team personnel charged with the design of a computerized KASS data bank for interfacing with the KASS models. (Pages 39-41)

INTRODUCTION

It has been said that an army travels on its stomach. Surely statistics are no less important to the operation of a government.

This report is about statistics — the agricultural statistics and data system in the Republic of Korea. It was undertaken as part of the Korean Agricultural Planning Project, a contract project between the Ministry of Agriculture and Fisheries, ROK, and Michigan State University. The general objective of this project (KAPP) is "to increase the capacity of the Ministry of Agriculture and Fisheries, and through it the government of the Republic of Korea, for sound planning, agricultural policy formulation, program development, and project design and execution toward more rapid and effective development of the agricultural sector."[1/] The project calls for long term (3 years) technical assistance personnel to work with MAF in three broad areas - policy analysis, agricultural outlook, and program and project evaluation - and short term technical assistance in the related area of agricultural statistics.

This report is the result of the work of the Korean Agricultural Statistics and Data System Task Force organized under KAPP with approximately 3½ man months of effort during June and July 1974. The objective of this task force was to review and make recommendations for the improvement of the Korean agricultural sector statistics collection and data system.

1/ Korean Agricultural Planning Project scope of work, contract between MAF & MSU.

To accomplish this objective the task force was charged with carrying out the following steps:

1. Conduct a comprehensive review of the present ROK agricultural statistics collection and data processing activities including a) means of collection, b) type of statistics collected, c) definition of terms, d) series processed, e) means and frequency of reporting series, f) logical consistency among series, and g) identification of present users.
2. Ascertain the relevance of statistics presently collected and processed, and determine collection and processed data gaps which would be potentially useful to the statistics and data users which MAF is interested in serving.
3. Conceptualize and make recommendations as to the institutional and operational design of a statistics collection and data processing system for MAF which uses modern collection, processing, storage, and retrieval technology and which services the multiple needs of the wide array of users of agricultural data.
4. Develop a specific and detailed work plan to implement the recommendations in such a way that the major portion of the newly conceptualize system can be functional by June 1975.

Steps 1 and 2 were completed by the task force. Steps 3 and 4 could not be completed given the time and personnel resources committed to the task force. However, some recommendations made by the task

force are intended to provided the basis for carrying out steps 3 and 4 in detail over the next several months.

PERSPECTIVE

Any government requires statistics for a variety of reasons. Among the more important are to have measurements at the economy, sector, subsector, and/or individual unit levels to:

1. Understand structure.
2. Measure and evaluate performance.
3. Monitor behavior under different conditions.
4. Use as a base from which to project or forecast.
5. Use as a base for planning for future development and growth.
6. Use in research and analysis.
7. Use in policy formulation, program development, project design.
8. Monitor and evaluate plans, policy, programs and projects.

For all of these purposes the statistics and data must be relevant, accurate, timely, and consistent. If any of the four conditions are not met, the purposes for which the data are to be used will not be fulfilled.

Relevant - Just as a hat maker cannot make the proper size hat by working from measurements of the customers foot, neither can sound planning be done without data which measures those variables with which the planner is concerned. Further, the raw data or measurements often must be processed in some way - aggregated, disaggregated, converted to another form, transformed, inflated, or deflated to

become a reflection or true measure of reality. Thus relevant data is that which is in a form which best helps in understanding the problem under study.

Accurate - Measurements can be only as precise and unbiased as the instruments and the collection method used, and the ability and care exercised by the people and institutions involved allow. Accuracy is also a relative concept and the degree of accuracy required of any data must be determined in the context of its use and the sensitivity of the result to it. Data and statistics are costly to obtain and the cost normally increases with the degree of precision. The degree of accuracy to be obtained is an economic problem of determining where the marginal cost of increased precision is equal to the marginal revenue of that precision level. (Or the marginal cost of not obtaining that precision). In any case, sound decisions cannot be made on the basis of inaccurate data, whatever the source of the inaccuracy.

Timely - Planning and policy decisions and program and project design adjustments must be made in a specific time context to be effective. Data upon which these decisions are based must be available when needed in order to be of maximum usefulness.

Consistent - Consistency has meaning both over time and among the data collected at any point in time. Consistency over time requires that the same measurements be taken at equally spaced intervals of time to develop data time series. Consistency among data collected requires that it be precisely defined and that the concepts provide a link from one form of data to another so that

it all "checks out." For example yield multiplied by area equals production just as per capita consumption multiplied by population minus losses minus imports plus exports equals production. The two production figures should match.

Thus a well organized and efficiently run statistics collection and data system should be able to deliver relevant, accurate, timely and consistent data to appropriate users for their decision making purposes as required.

It is against these criteria that the agricultural statistics collection and data system in Korea should be evaluated. Much of this system is centered in the Statistics Bureau, MAF. Parts of the system are located elsewhere both in and outside MAF. To the extent possible, this task force dealt with the total system wherever the parts were located and considered recommendations on reorganization of the parts to fall within its purvue.

KOREAN AGRICULTURAL DATA SYSTEM

The Korean agricultural data collection system can be viewed as composed of three groupings of agencies: 1) The Statistics Bureau, MAF, 2) other agencies in MAF, and 3) agencies outside MAF. Following is a brief description of the agricultural data collection activities of each of these three groups.

Statistics Bureau, MAF

Many significant improvements were made in the data collection and processing system of the Bureau of Statistics of the Ministry of Agriculture and Fisheries starting in 1974. The changes made in the organization for collecting agricultural data by the Bureau of Agricultural Statistics are of major significance in steps to improve the accuracy of such data. In the past, many of the surveys were entrusted to the provincial governments with the actual surveys and reports made by the staff of local governments. In other cases MAF enumerators collected data but were administratively responsible through the Ministry of Home Affairs. This "administrative channel" system, where "eye-method" of estimation was generally used and where there was strong temptation to bias the figures upward, led to much unsatisfactory data.

There has been established beginning in 1974, a completely new system of independent statistical offices -- one in each of the 9 provinces and a branch office in each of the 139 countries - under the direct control of the Ministry of Agriculture and Fisheries. Within the central Statistics Bureau Office two divisions share the responsibility for statistics collection, processing and dissemination. They are the Crop Statistics Division and the Economic Statistics Division.

In addition, completely new sample survey designs and methodology have been developed for data collection on crop area, yield and production;

livestock numbers and production; basic agricultural statistics; and samples have been expanded for other surveys. The new organization structure of the MAF Statistics Bureau is shown in Figure 1.

As can be seen in Figure 1, the two divisions in the Statistics Bureau are responsible for collection of 7 categories of statistics, plus the agricultural census. Brief descriptions of these categories are listed below.

Crop Statistics Division

Basic Agricultural Statistics. The purposes of this survey are to collect information on the basic factors of agriculture such as the area under cultivation, the number of farm households, the farm population, and to provide necessary data for the establishment of agricultural policies.

The country is divided for this survey into 25,762 Enumeration Districts within county boundaries, 100 households each. The E.D.'s were first classified into three groups depending upon the percent of the households that were farm households, then each into three further catagories depending upon the number of households in each E.D., then, by random selection, every 10th household was selected.

The results of the survey are presented in the Advance Report on Key Items and later published in the "Yearbook of Agriculture and Forestry Statistics."

Livestock Survey. The purpose of this survey is to obtain accurate statistics on the number of livestock by sex, age and breed, and the production of milk, eggs and chickens, to provide the necessary data for the establishment of livestock policies.

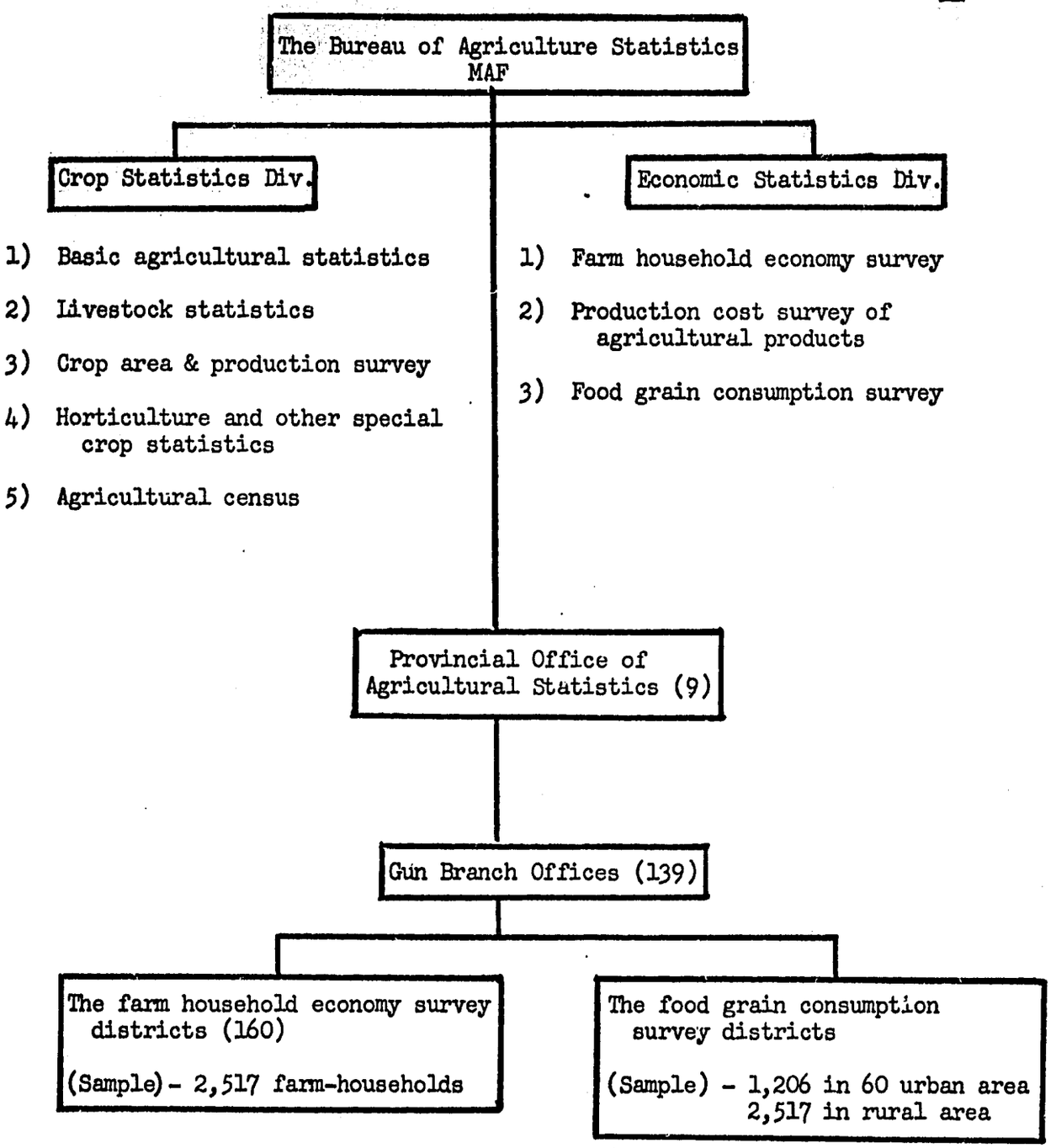

Figure 1. Organization Structure of the Statistics Bureau, MAF

This survey was started at the beginning of 1974, and the sample is the same as that for the Basic Agricultural Statistics Survey with the publication of the results also to be the same. The introduction of these surveys at the beginning of 1974 also is an important change in that far more reliable figures will be obtained on both basic agricultural items and livestock numbers and particularly the production of livestock products. Good sound data should be forthcoming from the large sample being studied.

Crop Area and Production Survey. The objectives of this survey, begun in 1974, are basically to collect accurate data on (a) the area in crops and the seasonal utilization of land and (b) the yields of all crops grown (except vegetables and fruits), so that the resulting calculations on total production are accurate, and to provide the necessary data for making agricultural policies regarding crop production and utilization.

As to sample, the 2.26 million hectares of farmland in Korea is divided into 1.13 million 2 hectare segments, from which, with a 1/25 sampling rate, 45,000 sample survey segments are randomly selected. These are classified into 48 categories. The area of the different crops grown during the season in each of the 2 hectare survey segments, and the yields of all the major crops (excepting vegetables and fruits) are determined by a randomly selected $3m^2$ plot in the field.

The results will be published in the "Yearbook of Agriculture and Forestry Statistics."

The introduction of this comprehensive survey with the beginning of 1974 is quite likely one of the most important data collection changes in the field of agricultural statistics and it will probably have far-reaching effects on the crop statistics of the country. This survey, if properly carried out, will correct one of the major shortcomings in the agricultural data system.

Horticultural and Special Crop Statistics. Data on the area and production of vegetables, fruit and special crops are still collected through "administrative channels" by the Agricultural Production Bureau. The area in these crops, especially the fruits and most special crops, is relatively small but is increasing and the value of production is increasing even more rapidly.

A study is currently underway regarding the development of an appropriate sample to obtain accurate data on these crops. The newly developed survey will be carried out by the Statistics Bureau.

The data that has been collected is found in the "Yearbook of Agricultural and Forestry Statistics."

Agricultural Census. The census falls into a different category than the annual data collected by the preceding surveys, since it is usually conducted every 5 or 10 years.

The agricultural census was first conducted in Korea in 1960. It was also done in 1970, and plans are now being made for a quinquennial census. This should provide much helpful information for analysis of

changes, and careful consideration is now being given to items to be included, the sample design, etc.

The results of the 1970 survey were published in 10 relatively large volumes with one volume for each province containing both county and township data. The 10th volume is the national edition and it contains provincial and county data.

Economic Statistics Division

Farm Household Economy Survey. The purposes of this study are broad, including obtaining information from the sample farms on receipts, expenses, labor input, rural consumption and other data which provides information about changes in the structure of agriculture and basic data for agricultural policy decisions and the estimation of national income.

This survey was started about 20 years ago was revised and expanded in 1962 when MAF took over responsibility for the study, and was expanded again to over 2500 households in 1974. The doubling of the sample from about 1200 households to more than 2500 not only gives a larger overall sample, but will provide a sufficient number of farm households in smaller areas to make possible the study of such areas, and in addition make possible a good study of structural changes in agriculture, and farm management analyses of various types.

A comprehensive report is published each year, entitled "Report of the Results of Farm Household Economy Survey." A wealth of information on the economic aspects of Korean agriculture is contained in it.

Production Cost Survey of Agricultural Products. The purposes of this survey are to provide fundamental data needed for the improvement of farm management and to determine aggregate input needs. It has also been used as one of several pieces of evidence in setting government purchase prices for agricultural commodities for price stabilization purposes.

The Bureau of Agricultural Statistics of MAF has been conducting this survey on rice, common barley, naked barley and wheat since 1962. In 1973, the following additional crops were included: cabbage, sweet potatoes, soybeans and corn.

The doubling of the Farm Household Survey sample from which the samples for these studies are drawn will not only make possible summaries by provinces or agricultural zones but will also allow more detailed regional analysis. It is to be hoped that more precise data can now be obtained on yields.

The results of this survey are published either as a separate report entitled "Report on the Results of Production Cost Survey of Agricultural Products," or as a part of the report on the household survey.

Food Grain Consumption Survey. The purposes of this survey are to determine food grain consumption in the rural and urban areas, and month-end household inventories of food grains, and to provide the necessary data for the formulation of food grain policies, such as the Food Balance Program.

Starting in 1974 the sample consists of 3700 households — 2500 in the rural areas and 1200 in the urban areas. The survey in the rural areas is integrated with the Farm Household Economy Survey. The urban sample was selected by stratified, self-weighting, three-stage sampling.

The data on the rural survey have been included in the report of the farm household survey. Data on the urban survey conducted by the Food Bureau prior to 1974 have been published in the "Yearbook of Agricultural and Forestry Statistics and Grain Statistics."

In summary, dramatic changes have been made in 1974 and are continuing to be made by the Bureau of Agricultural Statistics of MAF in their agricultural data system, which will result in a vast improvement of the data collected by it. Chart 1 summarizes the survey activity of the Statistics Bureau.

Other Agencies in MAF

To determine the extent to which agricultural data is collected and used by MAF agencies other than the Statistics Bureau, a survey of statistics collection activities of all MAF Bureaus was conducted. Chart 2 presents the results of that survey.

Several points are worth noting from the results displayed in Chart 2. First, 28 separate surveys are listed in Chart 2, compared with only 5 surveys listed in Chart 1 as conducted by the Statistics Bureau. Even recognizing that much of the data collected by the individual MAF Bureaus is for internal use, an unduly large number of surveys are being conducted by an unduly large number of agencies within MAF. Second, if one looks closely at the statistics being collected by this wide array of MAF agencies, one finds ample evidence of overlap - either the same data is being collected by more than one survey or the data is similar enough that it could easily be converted and used for the other purpose. Third, even with all of the

Chart 1. Surveys of the MAF Statistics Bureau*

Title	Purpose	Report period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Basic Ag. Statistics	Farmland, farm popn. Number of households	Yearly On Oct. 1 at present	1) Total farm popn., number of farm households, land area 2) Number of farm households and population, by nationality 3) Number of farm households and population, by type 4) Number of farm households and population, by size of land 5) Number of farm households and population, by age group 6) Area (total)	Complete enumeration until 1973 (Sample)	Interviewing visual survey (Interview and refer to land ledger)	Myon officials until 1973 (County level statistics office personnel)	Simple sum	Myun Gun Province National (Gun Stat.off. Provincl Stat.cff National)	1. Ag. policy makers 2. Ag. agencies, universities, researchers 3. Farm managers
Crop Area and Prod.	Food sector supply Improvement of farm management Ag. income estimation Ag. products price stabilization	Yearly (When each crop is harvested)	1) Rice production 2) Planted area of rice by variety 3) Planted area of paddy rice by type of irrigation 4) Planted area of rice by type of rice (glutinous and non-glutinous) 5) No. of plants, ears, grains and paddy rice 6) Rice straw production 7) Barley and wheat production 8) Planted area of barley & wheat by variety 9) Planted area of barley & wheat by season 10) Misc. grains & pulses prod. 11) Potato production	Sampling	Actual measurement and visual estimation	Gun officials (Gun Ag. Stat. Office personnel)	Simple sum	Gun Province National (Report directly from gun to central office)	

* Comment in parenthesis indicates plan beginning in 1974.

(Continued...) 2

Tital	Purpose	Report period	Content	Investigation Methcd	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Livestock Statistics	Livestock policy development	Quarterly	1) No. of livestock raising households 2) No. of livestock & poultry on hand 3) No. of households raising Korean cattle; No. of cattle by age and sex 4) No. of households raising Dairy cattle; No. of cattle by age, sex and breed 5) No. of households raising Beef cattle; No. of cattle by age, sex and breed 6) No. of households raising horses; No. horses by sex and breed 7) Sheep, deer and dog raising households; No. animals by age and sex 8) Pig households; No. pigs by age, sex and breed 9) Goat raising households; No. by age, sex and breed 10) Rabbit raising households; No. by sex and breed 11) Chicken households; No. by age, sex and breed 12) Duck, turkey, goose raising households; No. by age & sex 13) Beekeeping households; No. by breed 14) Commercial (industrial) sized livestock farms	Complete enumeration (Sample enumeration	Interview (Stated reference to ledger and interview	Myon officials (Gun Stat. office personnel)	Simple sum	Myon Gun Province National (Gun Stat. office, Province. Stat. office National)	

Title	Purpose	Report Period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Farm Household Economy	Farm household economy and management activities	Monthly	1) Major indicators of farm household economy (average per household) 2) Farm assets (average/household) 3) Farm household income and expenditure (average/household) 4) Agriculture income (ave/household) 5) Non-agricultural income (avg/hshd) 6) Farm household living expenses (average per household) 7) Changes in farm assets (avg/hshd) 8) General condition of farm (average per household) 9) Agricultural labor input (average per household) 10) Labor hours by work operation (average per household)	Record keeping by farmer	Enumerator	Enumerator	Simple average	National	Basic data for agriculture research and agr. administrators, estimation of agr. GNP
Production Cost	Setting agriculture product prices and improving ag. management	Yearly	1) Paddy rice production cost 2) Paddy rice production cost by size of land 3) Common barley production cost 4) Common barley production cost by size of land 5) Naked barley production cost 6) Naked barley production cost by size of land 7) Wheat production cost 8) Wheat production cost by size of land 9) Miscellaneous economic crops production cost (pilot survey)	Record keeping by farmer	Enumerator	Enumerator	Simple average	National	Data for policy development

data collected, some serious gaps appear where no data is available. Data on production and marketing losses by source is a case in point. Fourth, some data which is not currently relevant appears to be collected because historically someone wanted it and started its collection. Further, much of this data finds its way to print somewhere or another thus adding to not only collection but also processing, and dissemination costs. Data collected for internal administrative monitoring of programs which is of no use outside the agency concerned should not be processed and published. Other data collected by these agencies is needed by a wide array of users and yet it is often not published. In these cases one must question whether this data could be more efficiently collected, processed, and disseminated by the Statistics Bureau. An example of the former might be the treatment of dog diseases and of the latter prices received by farmers for major grains, or production of special crops. Finally a rather large portion of the data collected by other agencies in MAF is obtained through administrative channels. To the extent that the responsibility for collection of this data can be shifted to an expanded and reorganized Statistics Bureau, both greater collection efficiency and a higher degree of accuracy are likely to result.

Other Agencies Outside MAF

The task force had limited contact with agencies outside MAF with agricultural statistics collection responsibilities. Contact was made with statistic collection agencies in the National Agricultural Cooperative Federation (NACF), the Statistics Bureau, Economic Planning Board (EPB) and the Bank of Korea (BOK).

Chart 2. Surveys of MAF Bureaus other than the Statistics Bureau

Title	Purpose	Report period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
			Agricultural Production Bureau						
Rice insect and disease	Status of insects and disease affecting paddy rice	Every 15 days	Area affected by insects and disease Seriousness of effect of each outbreak	Case by case investigation of each outbreak	Actual measurement	Extension worker	Simple total	Extension office ORD National	1. Determine speed with which epidemic spreads 2. Disease prevention
Green Manure prod.	Status of green manure production	Yearly	1) Area planted to green manure crops 2) Production of green manure 3) Production of seed for green manure crops	Complete enumeration	Actual measurement	Myon official	Simple total	Myon Gun Province National	Planning for organic fertilizer supply
Green manure seed production	Status of seed prodtion	Yearly	Green manure seed	Complete enumeration	Actual measurement	Myon	Simple total	Myon-gun Province National	For internal use
			Agricultural Special Income Projects Bureau						
Cocoon harvest and sales to government	Cocoon production & situation of sales to government	Twice year (spring fall)	Cocoon sales to gov't by grades, by hybrid and purebred	Complete enumeration	Record-keeping	Myon	Simple total	Myon-gun Province National	Internal office use (policy development data)
Structure of silkworm industry	Structure of sericulture and management conditions	Twice a year	Mulberry field size, silkworm production, organization, sericulture management situation	Complete enumeration	Record keeping	Myon	Total by structural class	Myon-gun Province National	

(Continued...) 2

Title	Purpose	Report period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Results of spring and fall silkworm incubation	Determine silkworm results by hybrid and pure strain	2 times a year	Silkworm incubation results by hybrid and pure strain	Complete enumeration	Record keeping	Myon	Simple total	Myon-gun Province National	Internal office use (policy development data)
Woven silk statistics	Amount of silk production by factory and by small spinners	Monthly	Supply and demand of spinning and silk treatment of materials and operational situation (seasonal)	"	"	Province	Simple total	Spinning factory Province National	"
Mulberry field situation	Mulberry field situation	Yearly	Area planted	"	"	Myon	"	Myon, gun Province National	"
Planting situation of kimchi vegetables	Situation on planted area	Yearly	Planted area (radish, chinese cabbage)	Sample	Visual inspection	NACF extension worker	Simple sum	—	For internal use by the concerned bureaus.
Yield projections for kimchi vegetables	Estimation production situation	Yearly	Radish and chinese cabbage production	Sample	Visual inspection	NACF extension worker	Simple sum	—	For internal use by the concerned bureaus.
Mulberry tree area	—	Yearly	—	Complete enumeration	Visual estimation	Gun	Total	Gun Province National	—
Cocoon production	—	Summer & fall	Production and government purchase situation	Government purchase	Audit of account books	Gun	Total	"	—

(Continued...) 3

Title	Purpose	Report period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Raw silk production	-	Monthly	-	Silk spinning mill	Account book inspection	Provincial silk spinning mill	Total	Province National	-
Inspection of raw silk for export	-	Monthly	-	Account book inspection	Account book inspection	Raw silk inspection office	Total	Inspection office National	-
			Livestock Bureau						
Milk production and consumption situation	Understand the state of milk and milk products production and marketing	Monthly	Milk market situation. Production & marketing situation, by amount of manufactured goods which passed inspection	Complete enumeration	Visual inspection and record keeping	Gun official	Simple total	City, gun Province National	Planning supply and demand for manufactured milk prod., planning milk prod. increase
Survey of milk product prices	Understand the situation regarding milk product price changes	Monthly	Understand the situation regarding milk product price changes	Sample survey	Actual measurement	Gun official	Simple average	City,gun Province National	Reference data on milk product price regulation
Dairy and beef farm situation	Situation of dairy and beef farms	Once a year	Location, area and management of meadows';Number of breeding animals	Complete enumeration	Actual measurement	Gun official	Simple sum	City,myon Gun,Province National	Planning milk prod. increase planning dairy cattle imports
Livestock product price	Investigate price changes for livestock products	Monthly	Investigation of livestock product prices by item	Sample survey	"	Livestock cooperative officials	Aver.	City,gun Province National	Price Control
Production of mixed feeds	Mixed feed supply and demand	Monthly	Mixed feed production by type and by factory	Complete enumeration	Audit of acct.book	City,gun Province official	Simple sum	City,gun Province National	Feed supply, demand and marketing

(Continued...) 4

Tital	Purpose	Report period	Content	Investigation Method	Data Collect Method	Data Collect. Personnel	Aggregation	Aggregation Agency	Utilization
Inspection of milk	View amount of milk inspected	Monthly	Milk production and amount that passed inspection	Complete enumeration	Record keeping inv.	Livestock product inspector and city, gun	Simple sum	City, gum Province National	For internal use
Inspection of processed livestock products	View the amount of livestock products ins-	Monthly	Other livestock product production and inspection	"	"	"	"	"	"
Report on situation regarding illegally sold livestock prod.	View the regulation and actual situation regarding illegal butchery and forbidden lvstk production	Monthly	Marketing of illegally slaughted cattle and hogs and forbidden products	"	"	Person who supervises inspection and inspector	"	City Province National	"
Report on breeding & artificial insemination	View the practice of artificial insemination of animals & the conception results	Quartely	Investigation of the carrying out of artificial insemination in Korean cattle, dairy cattle, and pigs	"	"	City, gun livestock coop.	"	"	Need to measure livestock performance
Inspection of new breeds & their development	Need for higher yielding breeds	Yearly	Look at inspection of high yielding breeds and their current designation	"	"	City, gun	"	"	"
Inspection of slaughter	Slaughter	Monthly	-	Application form	Application for slaughter inspection	Gun unit inspection official	Total	Gun Province National	For internal use

(Continued...) 5

Title	Purpose	Report period	Content	Investigation Method	Data Collection Method	Data Collection Personnel	Aggregation	Aggregation Agency	Utilization
Report on the outcome of hatchery inspection	Examine state of hatchery affairs	2 times a year	Situation of hatchery capacity and purchases of fertile eggs	Complete enumeration	Actual measurement	City, gun	Simple total	City, gun Province National	Internal use
Mixed feed price	Understand price situation	Weekly	Mixed feed and wheat bran price situation	Sample	Interview (received reports by post card)	Province	Total	Province National	Internal use
			Food Bureau						
Survey of the price of food grain	Monitor the situation of food grain price changes	Daily investigation	Average quality; wholesale and retail price per 100 liter bag	Selected sample in 15 cities and 6 production areas	Telephone and interview survey	City, gun	Average of averages	City, gun Province National	Need to establish measures to regular the price of grain

The National Agricultural Cooperative Federation until recently was responsible for doing the agricultural outlook for the Ministry. Presently NACF does the outlook for only four crops - chinese cabbage, radish, red pepper, and garlic. (The kimchi commodities). They do, however, collect the following statistics:

1. Prices received by farmers; provides the major data series on commodity prices at farm level.
2. Prices paid by farmers; covers a wide range of items purchased by farmers; used to calculate an index of prices paid, and with the index of prices received to calculate the parity ratio.
3. Wholesale prices of farm commodities; this is a limited series of data on major agricultural commodities, it is collected monthly from the 5 largest city markets; the prices are not published.

The Economic Planning Board collects the following data of importance to agriculture:

1. Population and work force data; used in estimating demand for agricultural products.
2. Food expenditure and consumption by urban households; this apparently is the only comprehensive data available in Korea on food expenditures; used in analysis by NACF.
3. Retail price data; measures of changes in consumer prices; should be used in analyses of consumer demand for food products.

The Bank of Korea collects the following data of importance to agriculture:

1. National income data; they use production and price data from MAF to compute the contribution of agriculture to gross national

product. Analysts in MAF, NACF etc. use this overall income data to estimate the demand for agricultural products.

2. Wholesale prices including agricultural commodities; collected three times each month (5th, 15th, 25th of each month) and published monthly. These price data are important for analysis and understanding of the agricultural commodity markets.

Two major points are obvious from the above lists. First, one must question the relevance of NACF collecting the three price series, particularly as they are scheduled to phase out of the agricultural outlook work for the Ministry. Second, one must look further at the similarities and differences between the EPB food expenditure and consumption by urban households survey and the MAF urban grain consumption survey to determine if overlap and thus inefficiency exists.

ANALYSIS AND CONCLUSIONS

Agricultural Data Review and Coordinating Committee. One point which kept reoccuring in the discussions with officials concerned with statistics was the extremely limited amount of interaction taking place between the collectors, processors, and users of agricultural statistics. At the national sector wide level a Statistics Council exists, consisting of 11 government representatives and 11 university professors, chaired by the Prime Minister. The agriculture representative to this council is the Minister of MAF. The Statistics Council advises on statistical standards and other statistics problems at a

high policy level. The Statistics Standards Division in the Statistics Bureau, EPB is charged with coordination of statistics collection, processing, and publication among all government agencies. This is a big job given the limited resources of this division. Thus the division tends to function passively, reacting to requests for approval of change, rather than actively initiating improvements and coordinating change. Since data systems in most countries grow and become institutionalized piecemeal, as needs are identified and as resources are made available somewhere in the system, more in the way of coordination is usually needed than is operational at any time point. This is no less true of the sectors and subsectors than of the economy as a whole.

In agriculture, it appears that there has not been much discussion between the "collectors of data" and the "users of data" relative to the user's needs and what the collectors of data could provide. This too, is not unknown in other countries. But that does not mean that there could not be a significant improvement in the usefulness of the data collected, and in effect, much greater returns for the funds expended in obtaining the data, if there were such collaboration.

An Agricultural Data Review and Coordinating Committee should be established in Korea with prime responsibility in MAF. The objectives of this committee should include:

1. To operate as a staff resource to the Minister of MAF for his participation as a member of the Statistics Council.
2. To establish broad policy and agency responsibility for collection and processing of each of the datum bits required in the agricultural sector.

3. To coordinate the statistics and data collection efforts to minimize gaps, and overlaps, and to make the system responsive to the needs of the multiplicity of users.
4. To continuously monitor the data collected for relevancy and to recommend change, further development, and adaptation of the agricultural data system as changed needs and new technology are identified.
5. To coordinate publication and interagency dissemination of data to insure timeliness and efficiency.

Guidelines for committee establishment and operation might include the following.

First, an important consideration is the representational make up of the committee. When the agricultural data system is viewed as described above it is apparent that important parts of the system lie outside MAF. Likewise users of agricultural data are neither confined to MAF or even government agencies. Thus the committee should be made up of principal collectors and users of agricultural data wherever they are found. Apparent collector representatives would include Statistics Bureau, MAF; Statistics Bureau, EPB; Bank of Korea; and as statistics collection is presently organized, NACF; Food Bureau, MAF; and possibly other MAF Bureau such as Livestock and Farmland. Obvious users who should be represented include the MAF Planning and Budget offices as well as other MAF Bureaus with planning, policy, program, or project responsibilities. Other agencies and institutions which should be represented as users include NAERI,

KDI, EPB planning offices dealing with agriculture, ORD, NACF, and agricultural colleges in Universities. The committee should be kept small enough to be functional. Thus two types of representation might be considered - permanent and rotating. Permanent representation should include Statistics Bureau, MAF; Statistics Bureau, EPB; Bank of Korea as major collector agencies and Planning Office, MAF; Budget Office, MAF; NAERI as major user agencies. Rotating representation could include 3 representatives drawn from other collector and user agencies. This would constitute a 9 member committee.

Second, each agency might want to designate a relatively high level official such as Chief, Statistics Bureau, MAF as the representative and also an alternate representative. The committee representative would be expected to attend meetings whenever important decisions are to be made but some meetings of a "working" type could be attended only (or primarily) by the alternates. This would mean that plans for the committee's work and a specific agenda for each meeting would need to be worked out well in advance. Alternates would probably attend all meetings and see that the various work tasks get done on the part of each agency. However, the actual agency representative would be kept fully informed of any actions taken and would attend those meetings where major decisions are scheduled for consideration.

Third, exofficio members or consultants may be added and deleted on an ad hoc basis. For example, when working on specific problems of a technical statistical nature a statistics consultant from one of the

universities may be invited to participate. In the early stages it might be desirable to have selected KAPP and/or KASS representation, particularly if a KAPP statistician becomes a reality and/or when issues of conversion to electronic data processing are to be discussed.

Consolidation of Collection Efforts to Eliminate Overlaps and Gaps in Data. Further probing of the present operation of the agricultural data system points toward the need for reorganization of some of the collecting units and consolidation of collecting responsibility. Preliminary analysis done by the task force included examination of points where data by two or more agencies overlap and points where there appear to be gaps in the data system. One example of possible overlap is the collection of wholesale agricultural prices by both BOK and NACF. The BOK data is published regularly and is the official data on wholesale prices. The wholesale price data collected by NACF is much more limited in scope and is not published at all. It may be fully appropriate for NACF or some bureau of MAF to collect more detailed information on wholesale prices of agricultural commodities than is being collected by BOK. However, the point should be examined; and if the data seem worthwhile to collect, it probably should also be published. If the reason for double collection is a matter of timing - i.e. having the data available for a specific purpose before it is generally available through routine publication - then better coordination between the primary collector (in this case probably BOK) and the user should resolve the problem satisfactorily and at lower cost than maintaining a dual collection system.

Another example of apparent overlap concerns the survey of urban households by the Statistics Bureau of EPB and by the Statistics Bureau, MAF. Outlook analysts in NACF have generally used data from the EPB survey on household food consumption on the basis that the data are more comprehensive and that, at least until recently, the survey was larger and was thought to be more reliable. However, the Food Bureau uses data from the MAF urban household survey. These data are more limited in that they cover only major food crops. Another difference is that the MAF survey emphasizes quantity of household grain consumption, while the EPB survey emphasizes food expenditures in value terms.

Obviously those collecting the EPB data could, with marginal effort, obtain the data in quantity (and price) as well as value terms. With a minimum of coordination this could effect a cost saving as well as possibly provide a broader based, more representative urban household sample for obtaining the grain quantity consumption data. It would also insure a higher degree of consistency among the series. While the two surveys are substantially different, they should be re-examined in detail to assure that efforts are not being duplicated.

There are some apparent gaps in the Korean agricultural data system in spite of the fact that the information being collected is already quite extensive. Our preliminary analysis suggests that the most severe gaps may relate to production and marketing losses, nonfarm stocks of grains, and information about agricultural marketing and processing. More

complete data of this type, for example, could be quite helpful in improved analysis of the grain situation and in planning government grain management operations.

Further review of the fragmentation problem in the agricultural data system should be done. With respect to MAF agencies and related organization - NACF, ADC, etc. - which are presently engaged in data collection the following guidelines should be applied:

1. If the data collected is for internal administrative monitoring use by that agency only the responsibility for collection should remain with the agency. This data should not be published for wide dissemination.
2. If the data collected is or could be used anywhere outside that agency the responsibility for collection and dissemination should be shifted to the Statistics Bureau, MAF.

This will require that additional resources and personnel be provided to the Statistics Bureau; however, it is likely that a better set of statistics could be produced at lower cost than under the present fragmented system.

Accuracy and Timeliness. Consolidating the statistics collection efforts into the Statistics Bureau establishes the basis for several other improvements in the operation of the agricultural data system. First, the Statistics Bureau took a major step beginning in 1974, with the removal of

MAF field enumerators from the administrative jurisdiction of the local and provincial governments and Ministry of Home Affairs. Separation of the "statistics function" from the "operations function" removes the tendency for the goal oriented bias found in the data collected through administrative channels. Much of the data collected by the other agencies in MAF is still collected through administrative channels. Shifting the responsibility for collection of this data to the Statistics Bureau should improve the accuracy of such data.

Second, consolidation would provide the basis for more timely, more user oriented publication of agricultural statistics. A large amount of agricultural data is being collected, but the publication process is often very slow. Data are generally of little value until made available to the main users. And even then it is obvious that the greater the delay in publication or dissemination, the greater the loss in its usefulness. Delays in processing and publishing can also cause problems for other government statistical organizations. Diligent administration and management of the total system of collection, processing, publication, and dissemination of data with particular emphasis on meeting deadlines is necessary to insure timeliness. This can be done best by an agency whose major purpose is the operation of the data system.

A key means to insure both timeliness and accuracy of statistics is to have well trained personnel. As part of its on-going activity the Statistics Bureau should run training programs for field enumerators and central tabulation and processing staff in their areas of specialty.

User Oriented Data Publication. A couple of suggestions on data publications are in order. With respect to content and size of publications, many of the Korean agricultural data publications contain a tremendous amount of detail, so much so that it is easy for some of the major points of comparison or analysis to be lost. In addition the publication may be so large that potential users hesitate to use it. For example, the province level volumes of the 1970 agricultural census contain a full array of statistics down through the Myon (township) level. Even the national level volume contains data down through gun (county) level. This is unnecessary duplication and bulk. At the very least the publication of this data should be split out in different levels of volumes and the need for publication of Myon data at all is questionable.

For greater responsiveness to users the Statistics Bureau might consider different forms of data presentation in their publications. For example graphic presentation of gun (county) data in the provincial census reports on (1) degree of intensity of production (hectares of crops, number of head of livestock, production, etc.) and (2) the amount or percentage change in major items compared to five or 10 years ago. Also some simple or preliminary data analysis may be appropriate to include in some publications. For instance the Statistics Bureau and NAERI might cooperate in making fuller analysis of the Farm Household Survey data to portray structural changes in agriculture by province; or even obtain supplemental data so that analysis could be made of superior management factors on a sample of those farms; or use the Production Cost Survey in a study of the most efficient producers for use by gun agricultural officers and guidance workers, under ORD supervision, in promoting improved management of farms and more efficient methods of production.

Agricultural Outlook Activities. Since one member of this task force will return as the agricultural outlook analyst with KAPP and since agricultural outlook activities depend so heavily upon a continuous flow of timely and accurate statistics, a considerable amount of time was spent in understanding present operation and proposed plans for agricultural outlook work by MAF. Background materials on Korean agricultural outlook were reviewed and discussions were held with officials in the NACF Research Department and MAF to better understand the experience with agricultural outlook in Korea. Finally a discussion was held with the Director of the Sameul Division, Agricultural Development Bureau, MAF and a preliminary review was made of the revised plan for outlook work which was prepared in the spring of 1974 by the Agricultural Development Bureau.

The Government appears to be concerned about the need to strengthen work on agricultural outlook. The plan to transfer outlook work to MAF is an indication of this concern. Based on a very limited review of the status of outlook work, the following points appear to deserve mention as items of concern.

1. Lack of use of agricultural outlook results. It is of some concern that no reports have been published. However, the more serious point is that there has apparently been very little internal use of the outlook materials that have been developed. One reason is that there has been doubt about the validity of the materials, due in part to questions about the quality of the data available. The Statistics Bureau, MAF is now working to overcome these data problems.

2. Very little interaction between outlook workers and government policy makers. Part of this problem comes from the fact that for several years the main outlook work has been done by analysts in NACF who have very little access to the policy decision makers in MAF. If the outlook work can be moved into MAF and given a greater amount of resources, some of this problem can be easily overcome.

3. Review of outlook work may be at too high an administrative level. The basic agricultural legislation apparently requires that outlook materials be reviewed for approval by an Agricultural Policy Review Board. This board is to be chaired by the Premier, but in practice is normally chaired by the Minister of Agriculture. Some way needs to be found to allow outlook materials to be made available at least for internal use, with the main review and approval at a lower administrative level.

4. Lack of clear plans for adequate staffing of outlook analyses. The staffing level has been too low in past years. With the planned transfer of this function to MAF, the NACF staff currently assigned to outlook will apparently have no responsibility for analyses following a two year transition period. Plans for analytical staff appear to be minimal in the Agricultural Development Bureau. Plans call for NAERI to perform a supporting role in analysis, but the details for this analytical support apparently have not been worked out. Perhaps close coordination with the analyses of supply, demand, and price for major food crops now being done by the Food Bureau could be helpful.

5. Fragmentation and housing of outlook activity in action agencies. A more fundamental problem than any of the above, however, is in evidence. It has two parts. Under the proposed plan for outlook work, that portion of the outlook activity which will be titled agricultural outlook will become the responsibility of the Saemaul Division. However, much of the major outlook work to be done will not be called outlook and will be carried out by other bureaus in MAF. A notable example is the price, supply, and demand forecasting on major grains crops which will continue to be done by the Food Bureau. Thus one part of the problem is that the outlook activity in the Ministry will remain fragmented under the proposed outlook plan. The other part of the problem is that virtually all outlook activity will be done by action agencies. The same arguments for separating the data system from operations applies equally as well for separating outlook from operations. And the arguments are extremely strong in both cases.

This task force strongly recommends that MAF reconsider the proposed handling of the outlook function with respect to these two basic points. First, all outlook activity should be done by a single agency rather than being fragemented and done piecemeal by several MAF agencies. Second, the outlook activity should be divorced from the action agencies. Either the Statistics Bureau, or NAERI, or both in close cooperation should be seriously considered to take on the total outlook responsibility. Final decision on outside release of outlook results and/or publication should rest with the Agricultural Policy Review Board or its designated representative.

Use of Computer Technology. The MAF Statistics Bureau has already begun to use computer technology in processing some of the survey data and for the 1970 agricultural census. Present plans call for increased use of computers. How conversion to this new technology should be accomplished and over what period of time should be of some concern. The task force had neither the time nor the full range of competence necessary to make specific and technical recommendations in this area. However several ideas and cautions are in order.

A major caution is based on some familiarity with computer technology and knowledge of errors made elsewhere in adapting this technology. Some firms, institutions and government agencies elsewhere have attempted to convert to computer based operations all at once, and a few even dismantled their old system at the time of conversion. The result? Chaos! The problem is that with any new system, and particularly one involving computers, bugs must be ironed out and adjustments made before it will operate smoothly and efficiently. And the more complex the system the greater the likelihood of problems to be corrected. Thus conversion to a computer based data system should be well planned, proceed in well thought out stages, and the old system should continue to operate until it is absolutely certain that the new system is functioning properly.

As personnel become more familiar with the new computer technology, and particularily if a close working relationship is established with NAERI, it is likely that the Statistics Bureau will want to establish a fully computerized data bank with analytical software in order that the user can access and perform transformations on the data. Such a data bank could also be devised to automatically provide data to the analytical models constructed by NAERI and for the agricultural outlook models wherever located.

It could also be designed to automatically prepare standardized statistical reports such as the Farm Household Survey report and the Yearbook of Agricultural Statistics.

As conversion to a computerized data system is contemplated a "system approach" should be taken in its design. Each part of the system should be designed to logically and conveniently feed into the next part. For example, the field enumerators should collect their data in a standardized, precoded format for ease of transfering the raw data to the computer. The accounting and aggregation routines should be designed to provide all the output required without the need for any hand transformation. Output should be designed in the format required by the user. Throughout, the system should be designed for flexibility, ease of expansion and contraction, and ease of updating data series and files.

Over the next several months the KASS team will be designing a data system for use with the KASS models. While it will be much simpler and smaller than required by the Statistics Bureau, many of the design principles and much of the actual software structure will be the same. This should provide a good laboratory model and demonstration of the potential for a larger, more comprehensive system. Thus it would be beneficial for someone from the Statistics Bureau to be assigned to work with the KASS team on the conceptualization of and experimentation with a KASS data system with the view that much of what is designed and learned could be transfered for use by the Statistics Bureau.

Finally, as the computer is used more and more by the various agencies of MAF the decision on how best to obtain computer services becomes important.

Both the Statistics Bureau and NAERI have used the National Computer Center (NCC) facilities. Both agencies found this service inadequate due to slow turn around and high incidence of error and there seems little likelihood that these conditions will be corrected. NAERI now relies heavily on KIST while the Statistics Bureau uses the EPB facilities.

Decision will need to be faced in the near future concerning how to procure computer services for a variety of uses. Should MAF establish its own computer facility? Should it contract with an existing facility for services? Should the use be centralized and coordinated or decentralized and left up to each MAF agency? The issues are administrative, institutional, and technical in nature. A task force consisting of major potential computer users in MAF should be appointed to study the issues and make recommendations to the Minister. Otherwise the decisions will be made on an ad hoc basis or by default, likely creating a bad situation which may become extremely difficult and costly to correct.

Agricultural Statistics Consultant. The evidence documented in this report indicates that a number of problems exist in the Korean agricultural data system with respect to organizational structure, interaction between data collectors and users, overlaps and voids in data collection and processing responsibility, accuracy and timeliness of collected data. Problems also exist with respect to technical aspects such as survey design sampling, processing for geographic validity, and consistency of statistical series, both cross section and time series.

Since relevant, accurate, timely, and consistent data is required for sound planning, policy formulation, program development, and project design and evaluation, it is important for further development of the agricultural sector that these problems be resolved with dispatch.

The MAF Statistics Bureau Director has proposed that an agricultural statistician be employed to consult with MAF on these issues, under the KAPP contract. He has requested that the agricultural statistician be assigned for one year to work primarily with the Statistics Bureau, MAF. The Planning Coordinator, Vice Minister, and Minister have all concurred in this request. The MSU project director also agrees with the need, and believes that it falls within the scope of the KAPP activity to provide this technical assistance help. The Task Force recommends it.

A tentative Scope of Work for an Agricultural Statistician on a 1 year assignment with KAPP may include the following:

Objective: To recommend and help implement changes in the Korean agricultural statistics and data system with respect to collection, processing, storage, and retrieval of agricultural data to make the data more relevant, timely, accurate, and consistent for planning, policy, program, and project activities dealing with further development of the agricultural sector and the economy as a whole. This objective has both institutional and technical implications. Work will be primarily with the Statistics Bureau, MAF but will include within the scope of activity all components of the agricultural data system, broadly defined.

Technical work should include —

1. Review of sampling methods for all existing surveys. This includes technical advice on sample sized, selection of sample units, design for aggregation, collection methods and procedures, and training of enumerators.
2. Develop procedures for routine analysis of survey results for accuracy and consistency.
3. Design more user oriented formats and methods for presentation and summarization of data for users.
4. Design and implement methods for reconstruction of historical time series on agricultural sector structure and activity which are internally consistent and which can be linked serially for analysis.
5. Develop methods for using the agricultural census as a benchmark for adjustment of survey data collected in intercensul periods.
6. Design and develop procedures for any new or reorganized surveys which are necessary to fill in existing data gaps. For example, the need for market data on structure, volume, and prices is apparent. Data collection on production and marketing losses would also be useful.

Institutional work should include —

1. Making recommendations on restructuring the agricultural data system, particularly the collection and processing components for greater efficiency, more user orientation, greater accuracy, and more timely delivery.

2. Work toward operational effectiveness of an agricultural statistics committee consisting of collector, processor, and user representatives to develop broad coordinating policy for the agricultural data system and to insure its responsiveness to users.
3. Conceptualize and make recommendations as to the institutional and operational design of a statistics collection and data processing system for MAF which uses modern collection, processing, storage, and retrieval technology and which services the multiple needs of the wide array of users of agricultural data.

REFERENCES

Both published and unpublished sources as well as many personal interviews have contributed to the content of this report.

Published sources include the following:

1. Economic Planning Board, Bureau of Statistics, ROK. Statistical Organization in Korea, 1972.

2. Orleans, Leo A. "Chinese Statistics: The Impossible Dream," The American Statistician, Vol. 28, No. 2, May 1974.

3. Ministry of Agriculture and Fisheries, ROK. Yearbook of Agriculture and Forestry Statistics, 1973.

4. Ministry of Agriculture and Fisheries, ROK. Yearbook of Agriculture and Forestry Statistics, Grain Statistics, 1973

5. Ministry of Agriculture and Fisheries, ROK. 1970 Agricultural Census, 10 Volumes, 1974.

6. Economic Planning Board, Bureau of Statistics, ROK. Annual Report on the Price Survey, 1972.

7. Economic Planning Board, Bureau of Statistics, ROK. Monthly Statistics of Korea, No. 4, 1974.

8. The Bank of Korea. Monthly Economic Statistics, No. 4, 1974.

9. The Bank of Korea. Price Statistics Summary, 1970

10. The Bank of Korea. National Income Statistics Yearbook, 1973

11. Ministry of Agriculture and Fisheries, ROK. Statistics of Livestock in Korea, 1972

12. National Agricultural Cooperative Federation. Monthly Review, No. 3 and No. 4, 1974.

13. Economic Planning Board, Bureau of Statistics, ROK. Annual Report on the Economically Active Population, 1972.

14. Economic Planning Board, ROK. Korea Statistical Yearbook, 1970.

15. Ministry of Agriculture and Fisheries, ROK. Commercialization Statistics for Major Agricultural Products, 1972.

16. Ministry of Agriculture and Fisheries, ROK. Report on the Results of Farm Household Economic Survey, 1973.

17. Moon, Pal Yong and Yoo, Byong Seo. A Review of the Crop Production Estimates and Key Statistics Related to Grain Policy (Korea). Korea Development Institute, 1974.

18. Ministry of Agriculture and Fisheries, ROK. Report on the Results of Production Cost Survey of Agricultural Products, 1972.

19. Rossmiller, G.E. and Suh, H.H. The Problem and Consequences of Discrepancies Between Official Statistical Series: The Grain Production Example. Korean Agricultural Sector Study (KASS), Issue Paper 1, 26 March 1973.

20. Republic of Korea. Agricultural Statistics in Korea. Report for UN/FAO Asia and the Far East Commission on Agricultural Statistics, Fifth Session, Kuala Lumpur, Malaysia, 15-20 July 1974.

21. Economic Planning Board, ROK. Urban Household Consumption Survey, 1973.

Unpublished sources on file in the main KAPP office, MAF, 1306 Unified Government Building, Seoul, include:

1. Contract between the Republic of Korea and Michigan State University for the Korean Agricultural Planning Project, 1974.
2. Summary of NAERI Survey in 1973.
3. Memo by Lloyd Teigen, KASS, on Computerized Data Bank, 12 June 1974.
4. Production Cost Survey Ledger.
5. Memo by Tom Carroll, KASS, on Meteorological Data, 11 July 1974.
6. Outline of the Farm Household Economy Survey, MAF.
7. Farm Household Economic Survey Data collected by Karl T. Wright.
8. Enumerators Monthly Survey for the Farm Household Economy Survey.
9. Farm Household Economy Survey Summary Log Forms.
10. Outline of the Production Cost Survey of Agriculture Products, MAF, Enumerator's logs and summary sheets, with notes and comment by Karl T. Wright.
11. Food Grain Consumption Survey enumerator sheets and description by Karl T. Wright.
12. Basic Agricultural and Livestock Statistics Survey enumerator sheets and description by Karl T. Wright.
13. Crop Area and Production Survey enumerator sheets and description by Karl T. Wright.
14. Description of 1970 Agricultural Census and Questionnaire, MAF.
15. Review of Korean Agricultural Data System. Report of work by Karl T. Wright and David W. Culver on the MSU/KAPP Data System Study Team 1 June - 15 July and 1 - 29 June 1974 respectively.
16. Memo on Korean agricultural data needs for MAF and KASS by Karl. T. Wright.

17. Notes for Discussion of Data Task Force Progress and Plans by David W. Culver.

18. Data available on Soils and Fertilizer Response by Karl T. Wright, 5 July 1974.

19. Reasons for Differences in Yields as Reported through "Production Survey" and "Cost Survey" by Karl T. Wright, 20 June 1974.

20. Memo on Possible Benefit of a Review/Coordinating Committee on Agricultural Data Needs by David W. Culver, 10 June 1974.

21. Memo on Survey of Statistics Collection Activities of MAF Bureaus by G. E. Rossmiller.

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